

Development of New York State Guidelines for Post-Storm Redevelopment Plans
New York State Coastal Management Program
2008 Coastal Fellowship Proposal

1. Background and Introduction

The New York State Department of State (DOS) Division of Coastal Resources (DCR) provides technical assistance on coastal hazards to local governments, state and federal agencies and other organizations as one component of our Coastal Management Program. This work includes direct planning assistance to local governments, as well as participation with the New York State Department of Environmental Conservation (DEC), the US Army Corps of Engineers (USACE) and local governments, in development of congressionally authorized storm damage reduction projects. At the present time, DCR is advocating incorporation of post-storm redevelopment plans for communities as a component of the Fire Island to Montauk Point Storm Damage Reduction project (FIMP). We are also proposing a modification of state legislation to reduce the local cost share for engineered shore protection only in projects where communities prepare post-storm redevelopment plans. Increasing demand for post-storm redevelopment planning comes from initiatives, such as the recently announced Governor's Sea Level Rise Task Force, in which DCR participates. The Task Force will need to respond to increasing risks to development associated with sea level rise and DCR will advocate post-storm redevelopment planning as a cost effective means of adapting to future conditions.

The purpose of post-storm redevelopment plans is to reduce future exposure to coastal hazard damage during the rebuilding process. Large areas of New York's marine coast, including New York City, Nassau County and Suffolk County, are already developed. With billions of dollars worth of development already existing in areas prone to storm damage, it is not feasible to acquire, relocate or defend all development from coastal storm damage. Instead, it will be necessary to guide post-storm reconstruction into more hazard resistant locations over the course of time to create sustainable communities.

The New York State Emergency Management Office (SEMO) estimates over \$680 billion in building stock exists in the seven counties comprising New York City and Long Island. Over 11 million people live in these counties. This region is vulnerable to damage from both tropical and extra-tropical storms. Thirty-two tropical storms impacted the area between 1888 and 2005. In order to achieve disaster resilience, effectively use funding assistance, and avoid repeating the mistakes of high-risk development, our communities need planning guidance in place before storm damages occur.

At the present time, there is little guidance on the content of an effective post-storm redevelopment plan or means of measuring when a post-storm redevelopment plan provides sufficient risk reduction to create a disaster resilient community. Resilience to coastal hazards is the capacity of the economic, cultural, social and environmental resources of a community to endure expected impacts without significant impairment. This proposal is aimed at developing guidance on the content of a post-storm redevelopment plan and a community resilience index (Index) to assess existing coastal hazard exposure and the effectiveness of proposed management measures. The Index will incorporate performance assessment of the post-storm redevelopment plans.

2. Goals and Objectives

The object of the proposed work is to prepare a guidance document that can be used by local governments in New York State for preparing post-storm redevelopment plans. The document will include a rationale for preparing post-storm redevelopment plans, an outline of the content for a

satisfactory plan, a process for obtaining and incorporating appropriate information, examples of potentially effective management measures, and a means to assess and report community resilience (Index). The guidance document will provide sufficient narrative for communities to understand the need for each component, the application of each component, the order of their use, and their incorporation into the plan. Since the purpose of preparing a post-storm redevelopment plan is to increase community resilience to coastal storm hazards, the Index is required as a means of measuring that resilience. The Index alerts the community to existing risk as well as creating a means to assess alternative management measures and performance over time.

As a result of the fellow's work, DCR's capacity to provide technical assistance on coastal hazards to waterfront communities throughout the state will be improved, and the DCR role on the NYS Sea Level Rise Task Force will be enhanced through appropriate fellow participation.

3. Milestones and Outcomes

Month 1: Introduce fellow to the New York Coastal Management Program, DCR coastal hazards management efforts and roles of other agencies and local governments, and the Sea Level Rise Task Force work. DCR provides briefing and introductory reading material. Discuss the scope of the work with the fellow and how the work supports DCR's mission. Arrange supervisory protocols and reporting schedules. DCR provides access to New York State Library, work station, computing resources and software.

Product: Coastal Fellow integrated into DCR organization and work flow.

Months 1 through 3: Fellow conducts research on post-storm redevelopment plans, coastal storm impacts, vulnerability, community resilience and sustainability. Document sources with notes on relevant content.

Product: Post-Storm Redevelopment Plan and Community Resilience Bibliography set up.

Months 4-6: Review hazard exposure conditions typical of New York coastal communities and compare to existing risk and vulnerability estimating tools. Conduct site visits. Evaluate incorporation of new NFIP map coverage, and existing DCR video, photographic and GIS coverage into risk and vulnerability assessments. Draft post-storm redevelopment plan guidance outline. Initiate development of risk and vulnerability monitoring program and a simple mechanism for damage reporting. Explore value of standardized reporting with community contacts, and propose content for damage reports.

Product: Initial processes for risk and vulnerability assessments. Proposed damage experience reporting tool.

Month 7-8: Prepare post-storm redevelopment plan content. With DCR approval of outline, begin preparing draft guidance on plan sections. Include draft rationale for preparing a plan. Continue bibliographic notes on relevant sources. Identify and prioritize additional information needs. Begin list of storm damage mitigation/post-storm redevelopment adaptive management measures (tools) that improve resilience, with references, explanations and illustrations.

Product: Plan rationale and draft guidance based on approved outline for post-storm redevelopment plan. Priority list of additional information requirements. Initiate management tools resource list.

Month 9-10: Prepare draft process for Community Resilience Index. Propose and begin evaluation of alternative means for assessing and reporting resilience. Outline information requirements for economic, cultural, social and environmental resilience indicators. Continue to advance list of adaptive management tools and coordinate estimated effectiveness with the Community Resilience Index.

Product: Draft Community Resilience Index process and outline economic, cultural, social and environmental indicators. Adaptive management tools coordinated with Index as they are identified.

Month 11: Fellow, with DCR assistance, organizes a regional meeting or individual meetings with local governments and public agencies to discuss existing measures of resilience, risk exposure, post-storm redevelopment planning, adaptive management tools, and damage reporting. Discuss existing storm preparedness, vulnerability and anticipated post-storm redevelopment condition. Attempt to describe community sensitivity to risk and relate to actual risk exposure. Identify potential reporting pathways by which information on resilience can be received. Fellow to prepare summary of findings.

Product: Meeting with local governments and public agencies held. Short summary of community perceptions of coastal storm risk and existing plans for post-storm damage redevelopment.

Months 12-15: Evaluate opportunities for integration of guidance with other initiatives (storm damage protection projects, legislative or policy initiatives, sea level rise task force, integration with Local Waterfront Revitalization Plans, Hazard Mitigation Plans or other local or regional planning or coastal hazard management efforts). Summarize opportunities to advance post-storm redevelopment planning and remaining information gaps. Continue development of Post-Storm Redevelopment Plan guidance, adaptive management tools and Community Resilience Index. Provide schematic description of Index options able to assess economic, cultural, social and natural resilience. Recommend a small sample location and conditions description that can be used to demonstrate the application of the Community Resilience Index and carry out a sample demonstration of the Index. Provide draft content for all sections of post-storm redevelopment plan and adaptive management tools.

Product: First complete draft of Post-Storm Redevelopment Plan guidance. Sample demonstration of Community Resilience Index. Adaptive Management Tools list 75% complete. Schematic Community Resilience Index options.

Months 16-18: Research existing community risk reporting processes (FEMA-NFIP, State Hazard Mitigation Plan). Develop draft community damage reporting mechanism. Identify any gaps in information necessary to prepare post-storm redevelopment plans, prepare damage assessments, monitoring and interpretation of conditions in Community Resilience Index. Assess the ability of existing community staff to support post-storm redevelopment planning, monitor conditions, utilize the Community Resilience Index and make periodic plan revisions. Assess the feasibility of implementing adaptive management measures during a storm recovery period and recommend measures to insure implementation or revise the process of incorporating resilience measures into the post-storm redevelopment plan so that only viable options are included. Summarize recommendations in a report to DCR and proceed with revisions to guidance as directed.

Product: Report documenting existing information sources, ability of communities to manage post-storm redevelopment plans and utilize the Community Resilience Index.

Months 19-21: Provide 75% completion report to DCR staff and discuss schedule for project completion. Revise adaptive management measures descriptions and draft rationale for preparing a post-storm redevelopment plan. Update analysis process for reviewing Adaptive Management Tools in Community Resilience Index.

Product: Revised adaptive management measures and post-storm redevelopment plan rationale. Updated Community Resilience Index.

Month 22: Present draft post-storm redevelopment guidance document to DCR staff and solicit comments. Demonstrate ability of Community Resilience Index to interpret results of alternative Adaptive Management Tools. Discuss comments received with DCR supervisory staff and revise guidance as directed.

Product: Presentation of post-storm redevelopment guidance document to DCR staff, comments from staff and appropriate revisions to the guidance.

Months 23-24: Complete final revisions to post-storm redevelopment guidance and recommend options for further development, distribution and outreach.

Product: Final draft post-storm redevelopment outline guidance complete with Post-Storm Redevelopment Plan Rationale, Community Resilience Index, Adaptive Management Tools. Recommendations for development and distribution.

4. Project Description

The fellow would research and prepare the content of a guidance document for post-storm redevelopment plan preparation, including community and hazard assessment, options available for reducing hazard impacts, and a measure (Resilience Index) of plan effectiveness. Along with the effectiveness measure, a monitoring program would be proposed that would adjust the Resilience Index as management measures are implemented over time and allow for adaptive management via evaluation of plan effectiveness as damage events occur. The fellow would be required to complete the following tasks:

- a. Hazard Exposure - Locate and review literature on the influence of the physical environment on the likelihood for coastal storm damage. Current estimates of storm frequency and intensity, areal impact probability, local topography, wave and surge potential, sea level rise, influence of adjacent waterbodies and coastal exposure shall be incorporated into a process for estimating the frequency and scale of damaging storm events. Prepare a means for New York communities to estimate and describe their potential to experience damaging storms over time. Exposure should be differentiated according to variation in applicable characteristics within a community as well as between different communities. Compile a bibliography of sources that can assist evaluation of hazard exposure.

Result: An outline process for communities to make individual assessments of coastal storm exposure will be created along with a bibliography of hazard exposure information sources.

- b. Vulnerability - Locate and review literature describing the vulnerability to coastal storm damage typical of New York communities. Prepare an outline process by which

communities can identify and describe their vulnerability. Local development patterns, infrastructure, public and private institutions, economic social and cultural activity, employers, recreation and natural resources shall be included in vulnerability estimates. Compile a bibliography of sources that can assist evaluation of the vulnerability of community assets.

Result: An outline process for communities to make individual vulnerability assessments will be created along with a bibliography of useful sources for making vulnerability assessments.

- c. Community Resilience Index - Based on the ability to describe coastal hazard exposure and the vulnerability of community assets, propose a means of estimating the damages a community will experience from coastal storms over time. The measurement or Coastal Vulnerability Index should report potential damages to social, cultural and economic activities and natural resources as well as direct damages to development and infrastructure. The Index should be capable of assessing existing conditions as well as future conditions assuming implementation of management options through a post-storm redevelopment plan. The Index should be easily comprehensible by community decision makers and should effectively communicate the amount and location of potential damages. Provide a description of how the Index is used along with a simple example application.

Result: A Community Resilience Index will be completed and demonstrated through an example application.

- d. Adaptive Management Tools - Research and identify tools, programs, measures and resources available to communities to manage, reduce or eliminate coastal hazard impacts by incorporation in a post-storm redevelopment plan. Each tool would have an effectiveness estimate that can be incorporated into the Community Resilience Index.

Result: A descriptive inventory of adaptive management options communities can use as examples to identify locally preferable options to become resilient to coastal hazards. Correlation of sample options with risk and/or vulnerability avoided in the description.

- e. Monitoring Program - Prepare a monitoring program that can be used by communities to update risk and vulnerability over time and whose results can inform and be reported in the Community Resilience Index. The monitoring program would also serve as a means to verify or revise hazard exposure and vulnerability estimates on which the Index is based as storm events occur. Include a standardized method or reporting damage incidents or extracting similar information from existing sources (FEMA-NFIP, New York State Emergency Management Office).

Result: A standardized community damage monitoring protocol is established.

- f. Rationale for a Post-Storm Redevelopment Plan - Using accumulated knowledge on post-storm recovery plans and literature reviewed on coastal storm risk exposure, risk exposure in New York coastal areas and community resilience, formulate a short rationale describing the benefits of preparing post-storm recovery plans and objectives to be achieved. The rationale will be incorporated into guidance for preparation of post-storm recovery plans.

Result: A simple rationale for post-storm planning is completed that can be communicated to local governments.

- g. Assemble Post-Storm Redevelopment Plan Guidance - Combine guidance on the above elements (Hazard Exposure estimate, Vulnerability estimate, Community Resilience Index, Adaptive Management Tools, Monitoring Program and Rational for a Post-Storm Redevelopment Plan) into a guidance document on how to prepare a post-storm redevelopment plan. The document should serve as a means for local governments to understand the benefits of post-storm redevelopment planning, the content of a plan, a means to estimate and report risk exposure and a selection of Adaptive Management Tools for reducing risk. During preparation of the guidance definitions of resilience will be explored to find an applicable, practical definition for New York communities.

Result: A workable definition of resilience for New York Communities will be created, the ability of New York Communities to achieve sustainability through storm hazard resilience measures will be estimated and a guidance document to help communities prepare post-storm redevelopment plans will be prepared.

5. Fellow Mentoring

The successful fellowship candidate will be housed within DCR. Office resources (telephone, computer, support staff, software) will be provided by DCR. The fellow will be a member of the Hazards Unit of DCR and will work under the direction of Hazards Unit Supervisor Barry Pendergrass. Mr. Pendergrass will provide the accepted candidate an initial briefing and regular opportunity for discussion regarding the nature of coastal hazard risks in the region, the government agencies involved in managing those risks, and the relationship of DCR, the other agencies and local government. The fellow will be exposed to coastal hazard managers at all levels of government.

The fellow will discuss progress with Mr. Pendergrass on a daily basis and work under his supervision. Mr. Pendergrass will introduce the fellow to other DCR staff and make any necessary arrangements for travel and contact with other agencies or local governments. The fellow will have opportunities to speak directly with agency personnel and local government staff involved in hazard management. DCR will provide the candidate an initial reading list and access to the New York State Library, from which additional research can be carried out. The fellow will have several opportunities to present their work to DCR staff during the course of the work. The fellow will have opportunities to recommend procedures for estimating risk and advancing the Community Resilience Index, which may include use of GIS, spreadsheet or database software, or other approaches accepted by DCR and suitable for local government implementation.

6. Project Partners

DCR and NYS Department of Environmental Conservation are working in partnership with the US Army Corps of Engineers on the Fire Island Inlet to Montauk Point Storm Damage Reduction project. Significant efforts on the part of local governments to address coastal hazards are already underway.

DCR supports planning for hazard mitigation on the part of the New York State Emergency Management Office (SEMO). Most recently this included comments concerning coastal storm risk and management measures for the current update of the State Hazard Mitigation Plan. DCR is well placed to coordinate risk assessment from SEMO with the proposed post-storm redevelopment planning.

DCR is one of several agencies and nonprofit organizations involved in the newly formed Sea Level Rise Task Force. The follow will have appropriate opportunity to participate with DCR staff in meetings and preparation of materials for task force consideration.

DCR has numerous contacts with local governments in New York State through various planning efforts including Local Waterfront Revitalization Programs (LWRPs) and Harbor Management Plans. Communities in the high risk areas of New York City, Nassau County and Suffolk County have LWRPs or are in the process of preparing them. DCR sponsors the South Shore Estuary Reserve Office which includes all communities with bay waterfront from East Rockaway Inlet through Hempstead Bay, Oyster Bay, Great South Bay, Moriches Bay and Shinnecock Bay. Many communities in this region are vulnerable to coastal storm risks. These existing contacts offer excellent communication opportunities for DCR to gather and distribute information on post-storm redevelopment planning.

7. Cost Share Description

DOS will provide two lump sum payments, \$ 7,500 the first year and \$ 7,500 the second year, from state funds. DOS will reimburse the Coastal Management Fellow for travel expenses incurred as part of the project, e.g., travel to and from meetings and site visits. DOS will also cover expenses for the Coastal Management Fellow to attend the Coastal Zone Management conference, up to \$2,000.

8. Thematic Area

The proposed project is ideally suited for a fellowship under Theme 1:

Contribute to development of Community Resilience Index for assisting and measuring hazard resilience in all areas - economic, cultural, social and environmental.

- a. Develop adaptive management tools for local resilience assessment.
- b. Develop post-disaster resilience evaluation methods and tools.

The proposal incorporates development and application of Adaptive Management Tools and a Community Resilience Index, including the requirement that the Tools can be analyzed by the Index. The Index is tied to necessary estimates of risk exposure and vulnerability. The theme is suited to existing needs for advancing post-storm redevelopment plans that addresses needs of New York communities. There is general recognition among local governments that engineered defenses do not provide absolute security against storm damages. At the same time, sea level rise, storm surge and erosion threaten already existing development. All levels of government are seeking means to address the emerging understanding of coastal hazard risk. Since many New York communities are already built out, planning tools that address existing risk and means of reducing damage exposure over time are needed. The Community Resilience Index offers a means to identify and highlight existing damage potential and a means to assess alternative management measures. The assessment of risk and vulnerability, and the description of Adaptive Management Tools, along with the Index, constitute a significant proportion of the content for a post-storm redevelopment plan.

Submitted By:

Sally F. Ball
Deputy Director
Division of Coastal Resources
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